Biochemical analysis of wilt disease-resistant Robusta coffee varieties of Uganda with prospect of use in herbal formulations

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Introduction

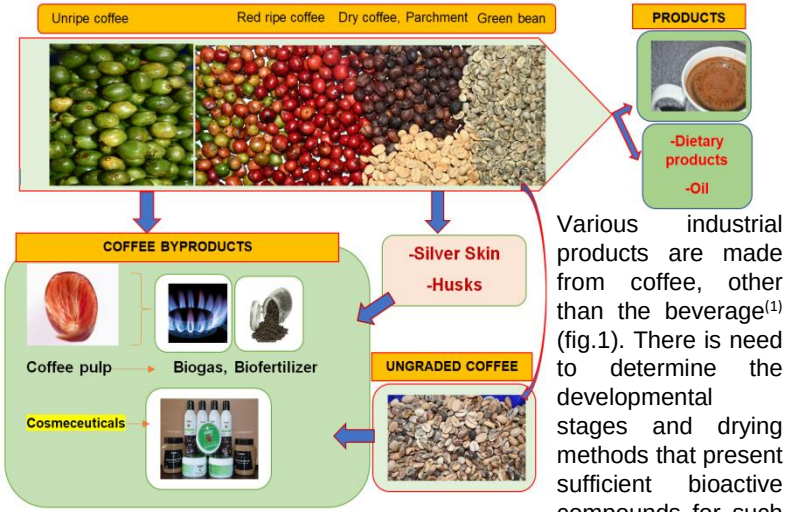

Fig 1: *Coffee value chain and possible byproducts*

Various industrial products are made from coffee, other than the beverage[1] (fig.1). There is need to determine the developmental stages and drying methods that present sufficient bioactive compounds for such applications.

Materials & Methods

Green unripe and red ripe cherries were picked from 7 coffee varieties and analysed fresh, for key biochemical compounds. Red cherries were further dried both by direct sun and under solar drier, processed into green bean and analysed for key biochemical compounds.

-Caffeine, Chlorogenic acid and Trigonelline were analysed using HPLC (Shimadzu, Nexera 20A, Japan) with DAD detector.
-B vitamins were analyzed using Agilent LC-qTOF equipped with Mass Hunter software.

Results &Discussion

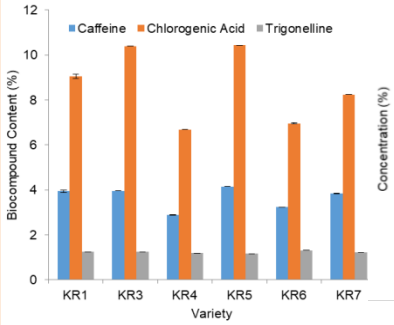

Fig 2: *Variety Bio-compound content*

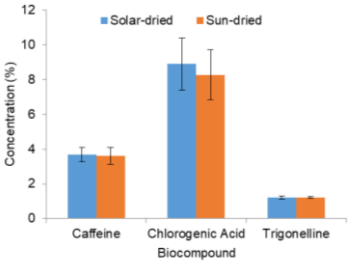

Fig 3: *Bio-compound content per drying method*

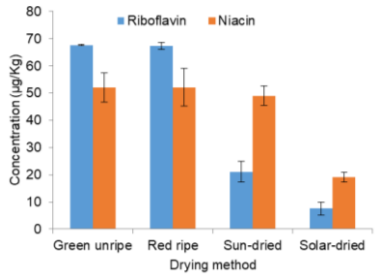

Fig 4: *B-Vitamin retention per drying method*

Caffeine (2.6-4.2%), Chlorogenic acid (6.6-10.4%) and trigonelline (1.1-1.3%) did not vary significantly ($P<0.05$) among the test varieties (fig.2) and between the drying methods (fig.3).

Riboflavin (67.1 ± 1.1 µg/Kg) and niacin (52.0 ± 2.1 µg/Kg) in fresh coffee, were retained more when the coffee was dried under sun, than in a solar drier (fig.4).

Conclusion/Perspectives

Low biochemical variability was observed among Uganda's coffee wilt disease-resistant varieties. Drying coffee at low temperatures should preserve bioactive compounds, with prospect of use in organic formulations for such applications as pharmaceutical and cosmeceutical.

References:
1. Klingel, T., Kremer, J. I., Gottstein, V., Rajcic De Rezende, T., Schwarz, S. & Lachenmeier, D. W. 2020. A Review of Coffee By-Products Including Leaf, Flower, Cherry, Husk, Silver Skin, and Spent Grounds as Novel Foods within the European Union. *Foods*, 9, 665.